

Description

Communications system for airport signaling devices

5

The invention relates to a communications system for signaling apparatuses at an airport, with the communications system having, as system components at least one central communications apparatus and a number of signaling apparatuses.

10

There are a large number of signaling apparatuses at airports, such as lighting devices, which may be located in particular on or in the vicinity of taxiways, ramps, taxiways or runways, or else, for example, on buildings such as hangers, on the tower or on other facilities. Signaling apparatuses may also include, for example, radar devices or radio beacons.

15

Airport lighting systems are currently known which are used essentially for monitoring the lamp function of the individual airport lights and in this case replace simple open-loop and closed-loop control signals. The power range of known systems such as these is restricted considerably, primarily as a result of serious interference factors. For example, the electrical characteristics of the cables that are used for communication change as a result of the varying moisture in the ground and as a result of aging phenomena, as well as as a result of the requirements for airfield operation becoming particularly stringent. Particularly in the case of airport operation, interference occurs to an unusual extent, severity and with an unusual irregularity as a result of other systems. Interference influences are caused, for example, by on-board electrical power supply systems, on-board radars, stationary radars, radio links or other mobile

20

25

30

35

REPLACED BY
ART 34 AMDT

WO 2004/000582

- 1a -

DE/DE2003/002411

radio systems, network command receivers, power and control cables located parallel to one another, reinforcing iron in ground fittings, fuel lines installed in the surfaces, and as a result of static
5 charges which are caused by flying operations.

The object of the invention is to provide a communications system of the type mentioned initially which takes account in a particular manner of the conditions of flying operations and significantly reduces not only the interference susceptibility, which is primarily a result of the application, and the complexity of existing airport lighting systems, but also significantly improves the communication in the airport ground area, with little installation complexity.

According to the invention, this object is achieved in that the communication between the system components is distributed over a number of frequency bands in a limited frequency range, and takes place via one or more circuits, by means of which the signaling apparatuses are supplied with power. The use according to the invention of a number of frequency bands in the sense of frequency multiplexing makes the communications system particularly robust against, in particular, pulsed interference of high intensity. There is no need for complex, broadband channel equalization since each frequency band can be considered as a simple attenuator with fixed attenuation and a constant phase. The robustness of the communications system is thus significantly improved, and the achievable data transmission rates are considerably increased.

30

The communication is advantageously subdivided into time slices. Such time-division multiplexing in conjunction with the use according to the invention of a number of frequency bands effectively minimizes problems of crosstalk between individual communication channels.

35

REPLACED BY
ART 34 AMDT

WO 2004/582

- 2a -

DE/DE2003/002411

A frequency range between about 10 kHz and about 150 kHz is advantageously used for communication. Contrary to expectations, this frequency range has been
5 found to be particularly advantageous with respect to the frequency spectrum of interfering external systems in the airport area.

Patent Claims

1. A communications system for signaling apparatuses
5 (3) at an airport, with the communications system
having, as system components (2, 3) at least one
central communications apparatus (2) and a number of
signaling apparatuses (3),
characterized in that the communication between the
10 system components (2, 3) is distributed over a number
of frequency bands in a limited frequency range, and
takes place via one or more circuits, by means of which
the signaling apparatuses (3) are supplied with power.
- 15 2. The communications system as claimed in patent
claim 1, characterized in that the communication is
subdivided into time slices.
3. The communications system as claimed in one of the
20 preceding patent claims,
characterized in that a frequency range between 10 kHz
and 150 kHz is used for communication.
4. The communications system as claimed in one of the
25 preceding patent claims,
characterized in that up to ten frequency bands are
used for communication.
5. The communications system as claimed in one of the
30 preceding patent claims,
characterized in that up to five time slices are used
for communication.
6. The communications system as claimed in one of the
35 preceding patent claims,
characterized in that the OFDM method is used for
communication.